Simone Fontana

Postdoctoral Reseacher

Email: fontana.simone@outlook.com
LinkedIn: simone-fontana-33a47970
GitHub: github.com/iralabdisco

EXPERIENCE

Università degli Studi di Milano - Bicocca   Milano, Italy

Postdoctoral Researcher at IRALab, Robotics Laboratory   March 2018 –PRESENT

- − Main research project: Perception for Agricultural Robotics
- − Other projects:
  - ∗ Drive win - improving driving skills in ageing population through VR and neurostimulation (Bicocca Starting Grant 2020)
  - ∗ USAD - Urban Shuttles Autonomously Driven
  - ∗ LONGEVICITY - Social Inclusion for the Elderly Through Walkability
- − Co-author of project proposals for national grants:
  - ∗ TERRAIN - TablE gRapes Robotic hArvestINg (PRIN2020)
  - ∗ Drive win - improving driving skills in ageing population through VR and neurostimulation (BicoccaStarting Grant 2020)
  - ∗ Future Together: the suburbs become garden knowing and mitigating the hydro-geological hazard (Fondazione Cariplo)
  - ∗ PROSECCO - Perceptive RObots Support Extreme Crop COntrol (FISR 2019)
  - ∗ DROP - Diserbo Robotico per l'Ortocicultura di Precisione (Regione Lombardia)
- − Main developer of:
  - ∗ Probabilistic Point Clouds Registration
    https://github.com/iralabdisco/probabilistic_point_clouds_registration
  - ∗ A Benchmark for Point Clouds Registration Algorithms
    https://github.com/iralabdisco/point_clouds_registration_benchmark
- − Contributor of TorchPoints3D - A unifying framework for deep learning on point clouds
  https://github.com/nicolas-chaulet/torch-points3d
- − Bachelor and master theses advisor (titles in theses' language):
  - ∗ Caratterizzazione di un sensore di posizione per lo sterzo di un veicolo a guida autonoma
  - ∗ Stima della pose tramite un sistema multi-IMU
  - ∗ Implementazione di un algoritmo per la Global Point Clouds Registration basato su Particle Swarm Optimization
  - ∗ Navigazione autonoma su strada in ambito urbano
  - ∗ Individuazione ed Evitamento di Ostacoli Dinamici per Veicoli a Guida Autonoma
  - ∗ Stima della traiettoria di ostacoli mobiliper un veicolo a guida autonoma
  - ∗ Progettazione e sviluppo di un'infrastruttura per un sistema di interazione tra veicoli a guida autonoma e pedoni
  - ∗ Sistema di controllo per base robotica outdoor
  - ∗ Implementation of a local planner for the USAD vehicle
  - ∗ Evaluation and experimentation of mapping and localization systems in the university campus
  - ∗ Construction of maps without dynamic elements

* Façade segmentation from 3D Point Clouds for vehicle localization using Openstreetmap
  - Reviewer for Scientific Venues
    * Journals:
      · Robotics and Autonomous Systems
      · IEEE Robotics and Automation Letters
      · IEEE Transactions on Neural Networks and Learning Systems
      · IEEE Transactions on Multimedia
      · Data in Brief
      · Signals
    * Conferences:
      · International Conference on Robotics and Automation (ICRA)
      · IEEE Intelligent Vehicles Symposium (IV)
      · International Conference on Intelligent Transportation Systems (ITSC)
      · International Conference on Intelligent Robots and Systems (IROS)
      · Intelligent Autonomous Systems Conference (IAS)

KRIA, Knowledge Research Imaging Application　　　　　　　　　　　　　Desio, Italy
R&D Software Engineer　　　　　　　　　　　　　　　　　　November 2017 - February 2018

  - Development of vision-based solutions for traffic enforcement and avalanche monitoring

ASL, Autonomous System Lab at ETH-Zurich　　　　　　　　Zurich, Switzerland
Academic Guest　　　　　　　　　　　　　　　　　　　　　January 2015 - July 2015

  - SHERPA, Smart collaboration between Humans and ground-aErial Robots for imProving rescuing activities in Alpine environments
  - Development of a novel point clouds registration algorithm for teams of robots

Università degli Studi di Milano - Bicocca　　　　　　　　　　　Milano, Italy
Research Assistant at IRALab, Robotics Laboratory　　　　　　February 2013 October 2017

  - Research and development of robotics and computer vision solutions

EDUCATION

Università degli studi di Milano - Bicocca　　　　　　　　　　　Milan, Italy
Ph.D. in Computer Science　　　　　　　　　　　　　　January 2014–October 2017

  - Thesis: "Robust Point Clouds Registration"

Università degli studi di Milano - Bicocca　　　　　　　　　　　Milan, Italy
M.S. in Computer Science　　　　　　　　　　　　　November 2010–February 2013

  - Thesis: "An indoor robotic system for documents delivery and people guiding"
  - Final Mark: 110/110

Università degli studi di Milano - Bicocca　　　　　　　　　　　Milan, Italy
B.S. in Computer Science　　　　　　　　　　　　　October 2007–November 2010

  - Thesis: "Algorithms and implementations for a "return to lib" attack"
  - Final Mark: 109/110

Publications

[1] S. Fontana, D. Cattaneo, A. L. Ballardini, M. Vaghi, and D. G. Sorrenti, "A benchmark for point clouds registration algorithms", *Robotics and Autonomous Systems*, p. 103734, 2021.

[2] S. Fontana and D. G. Sorrenti, *A termination criterion for probabilistic point clouds registration*, accepted to Signals, 2020. arXiv: 2010.04979 `[cs.RO]`.

[3] S. Bandini, S. Fontana, F. Gasparini, and D. Sorrenti, "Interaction autonomous vehicle-pedestrian: Dynamic vehicle behaviour as a function of subjective safety perception", in *29th IEEE International Conference on Robot Human Interactive Communication (ROMAN), Crowdbot Workshop*, 2020.

[4] D. Cattaneo, M. Vaghi, S. Fontana, A. L. Ballardini, and D. G. Sorrenti, "Global visual localization in lidar-maps through shared 2d-3d embedding space", in *2020 IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2020, pp. 4365–4371.

[5] D. Cattaneo, M. Vaghi, A. L. Ballardini, S. Fontana, D. G. Sorrenti, and W. Burgard, "Cmrnet: Camera to lidar-map registration", in *2019 IEEE Intelligent Transportation Systems Conference (ITSC)*, IEEE, 2019, pp. 1283–1289.

[6] A. L. Ballardini, D. Benetti, D. Cattaneo, S. Fontana, M. Vaghi, and D. G. Sorrenti, "Interpretazione della scena e localizzazione in ambito urbano per veicoli autonomi", in *Ital-IA-Convegno Nazionale CINI sull'Intelligenza Artificiale*, 2019.

[7] A. L. Ballardini, D. Cattaneo, S. Fontana, and D. G. Sorrenti, "An online probabilistic road intersection detector", in *2017 IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2017, pp. 239–246.

[8] G. Agamennoni, S. Fontana, R. Y. Siegwart, and D. G. Sorrenti, "Point clouds registration with probabilistic data association", in *2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2016, pp. 4092–4098.

[9] A. L. Ballardini, D. Cattaneo, S. Fontana, and D. G. Sorrenti, "Leveraging the osm building data to enhance the localization of an urban vehicle", in *2016 IEEE 19th International Conference on Intelligent Transportation Systems (ITSC)*, IEEE, 2016, pp. 622–628.

[10] A. L. Ballardini, L. Ferretti, S. Fontana, A. Furlan, and D. G. Sorrenti, "An indoor localization system for telehomecare applications", *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, vol. 46, no. 10, pp. 1445–1455, 2015.

[11] A. L. Ballardini, S. Fontana, A. Furlan, D. Limongi, and D. G. Sorrenti, "A framework for outdoor urban environment estimation", in *2015 IEEE 18th International Conference on Intelligent Transportation Systems*, IEEE, 2015, pp. 2721–2727.

[12] A. L. Ballardini, S. Fontana, A. Furlan, and D. G. Sorrenti, "Ira_laser_tools: A ros laserscan manipulation toolbox", *arXiv preprint arXiv:1411.1086*, 2014.

Teaching

- **Teaching Assistant** at Università degli Studi di Milano - Bicocca   2014 - PRESENT
  Computer Architecture
- **Teaching Assistant** at Università degli Studi di Milano - Bicocca   2019 - PRESENT
  Computer and Robot Vision

Languages

- **Italian:** first language

- **English:** C2
- **German:** A2

SKILLS

- **Programming Languages:** C++, Python, Matlab, Java
- **Other Skills and Knowledges:** Linux, Git, Mercurial, Unit Testing, UML, Embedded Software Development (ARM Cortex and Arduino), Electronics

10/03/2021